Law 270.6
Energy Regulation and the Environment
(Spring 2008

Units: 3
CCN (2Ls/3Ls): 49787

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Course Description:

Energy production and use drive the world's economies and offer hope for growth and prosperity. Yet, the extraction and use of fuels and the development of energy facilities are among the greatest threats to the global environment. This course introduces students to the legal, economic, and structural issues that both shape our energy practices and provide opportunities to overcome these critical problems. The course focuses primarily on the regulation and design of electricity systems and markets, since so many energy choices–the use of oil, natural gas, coal, nuclear, the green alternatives such as solar, wind, and energy conservation or "demand side management"– relate to the way we generate or deliver electricity, or avoid the need to do so. Next to the use of petroleum for transportation, electric generation is the greatest contributor to air pollution and the greatest source of greenhouse gas emissions. In addition, as urban and suburban development spread across the land, the maintenance and expansion of the electric transmission grid provide increasingly challenging land use problems.

The course examines both the traditional monopoly model of regulation and evolving competitive alternatives. The course exposes students to energy resource planning, pollution management, rate design, green markets, energy efficiency, demand side management, renewable energy portfolios, climate change, and carbon management. The course provides an introduction to administrative law and to practice issues in the field.

This syllabus was developed in collaboration with the Institute for Energy and the Environment at Vermont Law School.

Course Requirements:

1. Read the materials
2. Participate in class discussion and presentations. Class participation will account for 25% of your grade.
3. Complete several short written assignments accounting for 45% of your grade.
4. Write the final, take-home exam. This will account for 30% of your grade.

Texts:

Two books are available in the bookstore. Unless otherwise indicated, all other required materials are available on the web or through Westlaw. There is a copy of just about everything posted on the course web page. Many of the cases on the web page are shortened, for your convenience, so it pays to check it out. The books are:

1. **Required:** Tomain and Cudahy, *Energy Law in a Nutshell*, West 2004, ISNB 0-314-15058-7
2. **Required:** Course Reader (a very small one)
3. **Recommended:** Roberts, *The End of Oil*, Houghton Mifflin 2004, ISBN 0-618-56211-7

Introduction to Energy and Electricity

Class 1 – January 17

Introduction
Introduction to the course, including history of energy, relationship between energy and development, environmental and environmental justice impacts of energy generation, and an introduction to current energy issues. *Please prepare for the first class.*

Readings for class:

1. www.epa.gov/cleanenergy/impacts.htm. Click and thoroughly read the description of environmental impacts related to each fuel type.

Introduction to Electricity
An introduction to the basics of generation, transmission and distribution, efficiency, reliability, and ancillary services.

Readings for class:

1. Tomaine & Cudahy, *Energy Law* (*"Energy"*), West Group (2004), Chapter 8, "Electricity", introduction and "Industry Overview", pages 256 to the top of 264.
2. Ferrey, *Inverting Choice of Law in the Wired Universe: Thermodynamic, Mass, and Energy*, 45 William and Mary Law Review 1842 at pp. 1910-1914, "$E=MC^{2"}$ [summary of physical nature of electricity]. Make sure to read the accompanying footnotes.
3. National Council on Electricity Policy, *Electricity Transmission, A Primer* (2004) (*"Transmission Primer"*), Ch. 1, "Introduction"; Ch. 2, "Why has Transmission become so Important?"; Ch. 4, "Physical and Technical Aspects of Transmission"; Appendix pp.49-52. Optional: Review the Glossary to understand key terms. At a minimum, be prepared to refer to the glossary as needed. http://www.raponline.org/showpdf.asp?PDF_URL=%22Pubs/ELECTRICITYTRANSMISSION.pdf%22
4. "How does a transformer work?" http://www.energyquest.ca.gov/how_it_works/transformer.html

Recommended reading:

1. Roberts, *The End of Oil*, Chapter 1, "Lighting the Fire".

Public Utilities and Rate Regulation

Class 2 – January 24

Introduction to Finance and Regulatory Economics
Basic financial concepts; basic economics of competitive and monopoly markets; introduction to how regulation addresses natural monopoly.

Readings for class:

1. *Energy*, Chapter 1, "Energy Economics" pp.5-29 (top), and Section F, pp.33-36. *Please read pp.17 through the top of 29 slowly and carefully. Take the time to understand the graphs.*

Introduction to Monopoly, Public Interest, and Regulation
A brief introduction to monopoly, cost of service regulation; historical origins, cases, and commentary; major players.

1. *The Proprietors of the Charles River Bridge v. The Proprietors of the Warren Bridge*, 36 U.S. 420 (1837); *Munn v. Illinois*, 94 U.S. 133 (1876).
2. The "Portland Speech," A Campaign Address on Public Utilities and Development of Hydro-Electric Power, Delivered by Franklin Delano Roosevelt in Portland, Ore. on September 21, 1932.
3. *Power Loss* by Richard F. Hirsh, "Creation of the Utility Consensus" MIT Press (1999) pages 11-31. This book provides a useful overview of the development of energy regulation in the last 30 years. On course reserve in the Law Library.
4. *Energy*, pp. 264-269, "Regulatory Overview" (through "Regulation: 1935-1965").
5. American Public Power Association Fact Sheet http://appanet.files.cms-plus.com/PDFs/PPFactSheet.pdf (2 pages)

Class 3 – January 31

Hand in the first take-home assignment

Cost of Service Regulation Part 1
The role of a PUC, its organization, duties and procedures; how regulation works; rate base, rate of return, operating expenses; judicial review, including the first of the classic cases.

Readings for class:

1. Dworkin, *The PSB Process: The Scope, The Players, and the Rules of Practice*
2. *Energy* pp.130-136
3. *Smyth v. Ames* (1898) 169 U.S. 456;
4. *Bluefield Waterworks & Imp. Company v. Public Service Commission of West Virginia* (1923) 262 U.S. 679
5. *Federal Power Commission v. Hope Natural Gas Co.* (1944) 320 U.S. 591;
6. *Market St. R.R. Co. v. R.R. Comm. of California* (1945) 324 U.S. 548
7. *Jersey Central Power and Light Company v. FERC* (D.C. Cir. 1987) 810 F.2d 1168
8. *Duquesne Light Company v. Barasch* (1989) 488 US 299

Class 4 – February 7

Cost of Service Regulation Part 2
Examples of cases defining the limits of regulatory power, and a rate design exercise that we will discuss in class.

Readings for class:

1. *Orange County Air Pollution Control District v. Public Utilities Commission* (1971) 4 Cal 3d 945
2. *NAACP v. Federal Power Commission*, (1976) 425 U.S. 662
3. *Cantor dba Selden Drug Company v. Detroit Edison*, (1976) 428 US 579
4. *San Diego Gas & Electric Co. v. Superior Court* (1996) 13 Cal. 4th 893 (*Covalt*)
5. *People ex rel. Orloff v. Pacific Bell* (2003) 31 Cal.4th 1132
6. Weston, "An Overview of the Principles and Economics of Utility Pricing", Regulatory Assistance Project, 2003. (8 pages)

Class 5 – February 14

Turn in the rate design exercise, and be prepared to discuss it in class

Introduction to Deregulation
Then, we will lay out the fundamentals of deregulation and the circumstances that got us there.

Readings for class:

1. *National Council on Electric Policy – A Comprehensive Review of Electric Restructuring*, pp.8-9 (Description of PURPA)
2. *Power Loss* Chapter 7, pages 119-131. (The impact of PURPA) Library reserve.
3. *Energy*, pp.275-285 (top) (The 1992 EPAct and subsequent FERC actions)

FERC and the States – A Long Struggle for Control
The debate over market design and the development of key resources has featured a tug-of-war between the Federal Energy Regulatory Commission and the states. We will look at the historical evolution of the division of responsibilities for regulating generation and transmission.

Readings for class:

1. *New York v. FERC* 535 US 1.
2. *Pennsylvania Public Utilities Commission v. Bodman* – Complaint, filed by the Pennsylvania Public Utilities Commission on November 1, 2007 http://www.puc.state.pa.us/electric/pdf/NIETC_110207_DistrictCourtSuit.pdf

Resource Alternatives

Class 6 – February 21 **Introduction to Tradition Fuels, and Oil and Hydroelectric Power**

The choice of fuel for generating electricity has significant implications for the environment, the economy, the reliability of power delivery, and national security. After an overview of the fuel choices, we will discuss oil and hydroelectric power.

Readings for class:

1. *America's Electric Utilities*, pages 39-46. Library reserve.
2. *Energy Law*, Chapter 5 Oil pages 153-188.
3. "Turning Tar Sands Into Oil http://www.energybulletin.net/7331.html
4. "Oil Sands – Burning Energy to Produce It" http://www.energybulletin.net/18624.html
5. "Oil Shale May Be Fool's Gold" http://www.energybulletin.net/11779.html
6. *Energy Law*, Ch 10, "Hydropower", pp. 332-353.

Recommended Reading:

1. *End of Oil*, Ch. 2, "The Last of Easy Oil", Ch. 4, "Energy is Power", and Ch. 10, "Energy Security", pp. 251-258.

Class 7 – February 28 **Coal and Nuclear Power**

More than half of the electric energy offered to customers in the United States comes from coal-fired plants, and most observers expect these numbers to stay the same for many years to come. Is coal the fuel of the past or the fuel for the future? While a smaller percentage of our electric energy comes from nuclear power and no new nuclear generating plants have come into service during the last 20 years, some are looking for a nuclear rebirth, and Congress has taken steps to encourage that result. We will discuss the pluses and minuses of a nuclear power resurgence.

Coal

Readings for class:

1. Humphries, *U.S. Coal: A Primer on Major Issues*, Congressional Research Service 2003 http://www.legis.state.wi.us/lc/committees/study/2006/NPOWR/files/RL31819.pdf Read pp. 1-8, 10, 17, 25, 27-28, 32-33.
2. U.S. EPA *Acid Rain and Related Programs 2006 Progress Report* (Fall 2007) http://www.epa.gov/airmarkets/progress/docs/2006-ARP-Report.pdf Read pp.7-12 and pp.39-41 (How the New Trading Programs Work).
3. U.S. EPA Acid Rain Program. Web only at: http://www.epa.gov/airmarket/trading/factsheet.html
4. *Clean Air Markets Group v. Pataki* (2003) 333 Fed R 3d 82 (2nd Circuit)
5. *Global Warming and the Future of Coal – The Path to Carbon Capture and Storage* (2007) Ken Berlin and Peter Sussman, The Center for American Progress http://www.americanprogress.org/issues/2007/05/pdf/coal_report.pdf pp.6-26 (top)
6. *Keystone Bituminous Coal Assn. v. Debenedictis* (1987) 480 U.S. 470
7. *U.S. v. Law* (1992) 979 F.2nd 977
8. *Bragg v. West Va. Coal Ass'n.* (2001) 248 F.3rd 275

Nuclear Power

Readings for class:

1. Peter Bradford, *Nuclear Power's Prospects in the Power Markets of the 21st Century*, Nonproliferation Education Center, 2005.
2. *Nuclear Energy Institute, Inc. v. Environmental Protection Agency*. 373 F.3d 1251 (D.C. Cir. 2004).

Class 8 – March 6 **Natural Gas – The resource and its regulation**

Readings for class:

1. Colorado School of Mines, *From Reservoir to Burner Tip: A Primer on Natural Gas.*
2. *Energy Law*, Ch. 6 "Natural Gas", 189-222.
3. Montana State University-Bozeman, *Frequently Asked Questions concerning Coal Bed Methane*, available only on the web at http://waterquality.montana.edu/docs/methane/cbmfaq.shtml.

Natural Gas - The Future and LNG

Readings for class:

1. *National Petroleum Council, September 2003*, Executive Summary, pages 5-12
2. Yergin, *The Next Prize*, Foreign Affairs, Nov./Dec. 2003.
3. Spencer Abraham letter to Vermont PSB, July 17, 2003.
4. Andrew Weissman, *The Critical Need to Examine More Carefully the Role of Liquefied Natural Gas (LNG) in Meeting Future U.S Energy Needs*, Energy Ventures Group, LLP (2005), pp. 27-30 ("Conclusion").
5. *Prepared Direct Testimony of Jerry Havens*, pages 1-17. Library reserve.

Class 9 – March 13 **Renewable Energy – The Technologies**

This class will introduce: the types of renewable energy including wind, biomass, landfill gas, photovoltaics, esoteric sources, and energy storage as well as regulatory and legal strategies for encouraging the implementation of renewable energy options.

Regulatory matters including PURPA, stranded benefits under deregulation, System Benefit Charges and Renewables Trust Funds, life cycle costs and emissions, Renewable Portfolio Standards, Renewable Energy Credits, net metering, and tax credits.

Readings for class:

1. *American Energy – The Renewable Path to Security* Worldwatch Institute, September 2006 Course Website or http://images1.americanprogress.org/il80web20037/americanenergynow/AmericanEnergy.pdf
2. *Geothermal Power Plant Virtual Tour* http://www.calenergy.com/html/aboutus4.asp
3. *The Ethanol Illusion* by Michael B. McElroy, Harvard Magazine, November-December 2006, pp. 33-35 & 107.

Recommended Reading:

1. *The End of Oil*, Chapter 8 ("And now for Something Completely Different").

Renewable Energy -- The Programs

Renewable Portfolio Standard (RPS)

Readings for class:

1. *The Renewable Portfolio Standard – A Practical Guide* by Nancy Rader and Scott Hempling, Executive Summary pp. ix-xx. http://www.hemplinglaw.com/articles/RPS%20FINAL.PDF
2. *States with Renewable Portfolio Standards*, U.S. Department of Energy. Click on the interactive map to learn about the RPS programs in various states. http://www.eere.energy.gov/states/maps/renewable_portfolio_states.cfm?print

Green Tags and tradable Renewable Energy Certificates (RECS)

Readings for class:

1. Regulatory Assistance Project ["RAP"], *Renewable Energy Certificates and Generation Attributes* (2003). http://www.raponline.org/showpdf.asp?PDF_URL=%22Pubs/IssueLtr/RenewableEnergyCertificates.pdf%22

California Solar Initiative

Readings for class:

1. *California Solar Initiative Staff Update* (September 2007) pp.1-12

Class 10 –March 20 Turn in the third paper

Demand Side Management: Energy Efficiency

Energy Efficiency
Readings for class:

1. Southwestern Energy Efficiency Project, *The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest,* (2002), pp. ES 1-18 "Executive Summary", and 2-11 to 2-13 and 2-19 to 2-25 "Specific Savings Opportunities". http://www.swenergy.org/nml/New_Mother_Lode.pdf
2. National Action Plan for Energy Efficiency Vision 2025 (2007) http://www.epa.gov/solar/pdf/vision.pdf pp.ES-1 toES-5
3. *Southern California Gas Company v. Public Utilities Commission,* (1979) 24 Cal.3d 653

Demand Response
Readings for class:

1. Cowart, *Efficient Reliability,* RAP 2001, pp. 28-53, ("IV. Why Don't Electricity Markets Support Efficiency and Load Management? Market Flaws and Market Barriers in Today's Power Markets" and V. Tapping the Demand-Side Reservoir"). http://www.raponline.org/Pubs/General/EffReli.pdf

Institutional Options for Delivery of Energy Efficiency
Readings for class:

1. Hamilton & Dworkin, *Four Years Experience of the Nation's First Energy Efficiency Utility: Balancing Resource Acquisition& Market Transformation under a Performance Contract* (2004).

Class 11 – April 3 Turn in the optional paper

Performance Based Ratemaking and "Decoupling"
Under traditional ratemaking, utilities generally make higher profits if they sell more power and lose profits as customers become more efficient.

Performance-based ratemaking can address the problem of utility disincentives to promote customer energy efficiency by "decoupling" utility profits from the amount of sales. It also is a mechanism that can encourage beneficial behavior in many areas of utility operation.

Readings for class:

1. Cavanagh, Testimony before the Idaho Public Utilities Commission in The Matter of the Application of Idaho Power Company for Authority to Increase its Interim and Base Rates and Charges for Electric Service, February 18, 2004 (excerpts).
2. Weston "Summary of Performance-Based Ratemaking," 2004. Reader. Read this short piece slowly. It describes a per customer-rate cap system, one way to "decouple" revenues and sales volumes.
3. RAP, *Performance-Based Regulation for Distribution Utilities,"* 2000, pp. 19-21 and pp. 25-27. http://www.raponline.org/Pubs/General/DiscoPBR.pdf

Integrating Resource Planning and Portfolio Management

Integrated Resource Planning and Portfolio Planning
Introduction to Integrated Resource Planning and Portfolio Planning for the right mix of generation types, transmission and conservation.

Portfolio Management ("PM") and Integrated Resource Planning ("IRP") both constitute planning exercises and present similar issues. PM, a newer term, focuses on a single utility or other load serving entity. IRP can be performed by a state regulator on a system wide, regional or service area basis, or by a utility for its service area.

Readings for class:

1. Vermont Code Title 20, Sec. 218(c) requiring an IRP.
2. *America's Electric Utilities*, pages 91-98. Library reserve.
3. Synapse Energy Economics, Inc., *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*, RAP, October 2003. Read: Table of Contents, Executive Summary pp. ES 1-7; Appendix A, pp. A-1 to A-10; Appendix B, pp. B-1 to B-3; and Appendix C, pp. C-1 to C-3. http://www.raponline.org/Pubs/PortfolioManagement/SynapsePMpaper.pdf
4. PacifiCorp, *Integrated Resource Plan 2003.* This is an excellent example of a utility-prepared IRP. Read the Table of Contents, pp. 1-36 ("Executive Summary," Ch 1 "Marketplace & Fundamentals: The Changing Context of IRP," and Ch. 2 "Current Position"); pp. 67-76 (Ch.5 Resource Alternatives); and pp. 151-157 (portions of Ch. 9 "Action Plan"). On reserve in the library. http://www.pacificpower.net/File/File25682.pdf
5. California Energy Action Plan.
6. California CPUC Decision 04-01-050 Excerpt.

Deregulation and Markets

Class 12 – April 10 **Wholesale Electricity Markets**

Readings for class:

1. ISO New England, Inc., *Standard Market Design*, 2003. These are selections from a series of short briefing papers describing the New England wholesale markets, including bilateral contracts, the day-ahead market, and the spot, or day-of market. Included in the Reader are: "Wholesale Electricity Trading"; "Background + Overview"; "Locational Marginal Pricing"; "The Multi-Settlement System"; "Market Monitoring and Mitigation"; and "Demand Response".
2. *Atlantic City Electric v. FERC* (D.C. Cir. 2002) 295 F.3rd 1, and *Atlantic City Electric v. FERC* (D.C. Cir. 2003) 329 F.3rd 856.

How do we deal with issues of using market power to manipulate markets? Is antitrust enough?
Readings for class:

1. Cowart, "Market Power and Market Monitoring--Critical Issues for Competitive Wholesale Markets." This is an issues memo for the China State Electricity Regulatory Commission summarizing options for combating market power beyond antitrust.

Retail Competition
Consumer choice, default service, disclosure and green power, the record so far.

Readings for class:

1. Brown and Sedano, *A Comprehensive View of U.S. Electric Restructuring with Policy Options for the Future*, National Council on Electricity Policy (June 2003), "Slow Development of Small Consumer Markets"; and State Approaches pp. 27-57. http://www.ncouncil.org/pdfs/restruc.pdf

Class 13 – April 17 **The California and Western Energy Crisis of 2000-2001, and The Environmental Impacts of Restructuring**

Readings for class:

1. Duane, *Regulation's Rationale: Learning from the California Energy Crisis*, 19 Yale Journal on Regulation 471 (2002), pp. 482-493, "The California Model: 1970s-1990s" and "Integrated Resource Planning: 1980s-1990s"; pp. 496-504, "'Restructuring' in California: 1992-1996", "Flaws in the AB 1890 Market Structure: 1996-2000", and "Paying Off Existing Utility Power Plants: 1996-2000"; pp. 507-524, " Chaos and Collapse: Economic Theory Meets Social and Political Reality"; pp. 535-540, "Conclusion". This article does an excellent job of explaining the California debacle, and in the process makes the pro-regulation, anti-restructuring case.
2. *Snohomish County v. FERC* (2006) 471 F.3d 1053
3. *The Environmental Impacts of Electric Restructuring: Looking Back, and Looking Forward*, Resources for the Future 2005, Discussion Paper 05-07 by Karen Palmer and Dallas Burtraw. http://www.rff.org/Documents/RFF-DP-05-07.pdf

Picking up the Pieces: Generator Suits, Blackouts, Reliability and Other Experiments
Readings for class:

1. *State of California ex rel., et al v. FERC (9th Cir. 2004)*, 383 F.3d 1006.
2. "Sinister Synergies: How Competition for Unregulated Profit Causes Blackouts", John August 2005. This is an anything-but-neutral article written by the head of a group that advocates against deregulation. Nonetheless, it raises some interesting and useful questions about the implications of restructured markets for grid management. Executive Summary.
3. Coalition for Energy Reform – California Energy Policy Recommendations.

Climate Change and Carbon Markets

Class 14 – April 24 **Climate Change and Carbon Markets**

Readings for class:

1. *In Brief: The U.S. Greenhouse Gas Inventory*, U.S. EPA pp.1-8. http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/RAMR5CZKVE/$File/ghgbrochure.pdf
2. *Policy Statement on Greenhouse Gas Performance Standards*, Issued by the California Public Utilities Commission on October 6, 2005.
3. *Overview of Constitutional Limitations on Out-of-State Procurement Rules*, IEPR Committee Workshop on Clean Coal Technology and Electricity Imports, Jonathan Blees. http://www.energy.ca.gov/2005_energypolicy/documents/2005-0817+18_workshop/presentations-081805/Blees_Jonathan.pdf
4. Climate Change and the California Public Utilities Commission's Role – A Discussion Paper.
5. Congressional Budget Office, "Issues in the Design of a Cap-and-Trade Program for Carbon Emissions" (November 2003). http://www.cbo.gov/showdoc.cfm?index=4861&sequence=0.
6. "Regional Greenhouse Gas Initiative Overview", from the RGGI website www.rggi.org.
7. *AB 32* California Greenhouse Gas Legislation, Signed September 27, 2006 http://info.sen.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf
8. *SB 1368* A companion bill http://info.sen.ca.gov/pub/05-06/bill/sen/sb_1351-1400/sb_1368_bill_20060929_chaptered.pdf
9. *In the Matter of Application 2006-01 Energy Northwest –Pacific Mountain Energy Center Power Project* (2007), Washington Energy Facility Siting Evaluation Council http://www.efsec.wa.gov/FILES/orders/833%20-%20PMEC%20stay%20adjud.pdf
10. California's Greenhouse Gas Policies: Local Solutions to a Global Problem? By Bushnell, Peterman and Wolfram, April 2007, University of California Energy Institute http://www.ucei.berkeley.edu/PDF/csemwp166.pdf
11. *California Governor's Executive Order S-20-06*, Issued October 18, 2006 http://gov.ca.gov/index.php?/executive-order/4484/

Recommended Readings:

1. *End of Oil*, Ch. 5, "Too Hot

Recap and conclusion.

Readings for class:

1. *Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges*, National Commission on Energy Policy, December, 2004, "Key Recommendations" and "Introduction and Summary of Recommendations", pp. iv-xiv. Available at http://www.energycommission.org/files/finalReport/O82F4692.pdf